

Shark biology, ecology and management: introduction

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Sharks are iconic and important species that have captivated human imagination through cultural significance and media exposure. Sharks and rays are fished and utilised for products (flesh, fins, teeth), and nets and lines are employed to deplete sharks to improve our safety at beaches. On the basis of the compounding effects of exploiting these species, it is becoming clear that human impacts on shark and ray populations are often unsustainable and that many populations are seriously depleted, with some considered to be threatened with extinction. The ecosystem impacts of these actions are yet to be fully defined and questions about the status and role of sharks in various systems remain. This lack of understanding was the impetus for an international conference to gather experts, emphasise the need for greater information about shark and ray populations, and highlight the need to share data with colleagues around the globe.

This Special Issue of *Marine and Freshwater Research* is the result of an international conference, *Sharks International*, hosted in Cairns, Queensland, June 2010. The conference attracted 214 delegates from 22 countries. As the world's oceans continue to be utilised and altered, threats facing marine species will continue to increase in importance. As scientists, we are often not in a position to directly effect change because use of resources involves a complex mix of social, economic, political and environmental issues. Scientists can make a crucial contribution to appropriate and effective management and conservation of ocean resources through the production and communication of high-quality research outputs. In this Special Issue, we have assembled a subset of the interesting and important work presented at *Sharks International*.

The collection of papers in this Special Issue showcases the range of research being conducted on sharks and rays around the world. Topics include the following: taxonomy – the foundation of field-based studies and identification of species; basic biology and life history – a keystone to effective demographic analysis of populations and thus effective management; movement, presence and habitat utilisation – data integral to understanding current and future distributions of shark and ray populations and potential environmental and anthropogenic effects on them; assessment of current management practices and economic benefits of shark populations – the basis of successful future management, conservation and utilisation of these species; interactions of sharks with humans – a crucial consideration of how sharks interact with people and the

perceptions and actions people take on the basis of these interactions; and examination of physiological aspects of biology – information required to advance our understanding of the diverse species in this group. The present compilation covers a wide array of topics central to our understanding of sharks and rays. This is, however, just a sample of the work being conducted and the topics currently being examined.

Despite the great advances in understanding shark and ray species in recent decades, much research is still needed. New species are still being discovered and described. Fishing rates are still high and climbing in some areas, including those where new species are being discovered. Species could be lost before they are even known to science. The relationship of many species with their environment is not well understood. This is a key factor in a world facing changes in ocean conditions and chemistry that could profoundly affect these populations. Lack of knowledge on how long species live and their reproductive rates hamper our ability to manage and conserve populations. These are all critical areas of research, amongst many others, that will continue to drive shark and ray research into the future. Only when we are as informed as possible, can we as scientists help produce effective change for these species. Publication of these efforts is our best, most powerful way of contributing to research, management and conservation of these populations. We hope that the present issue will help highlight the need for research on these species and will spur a change in awareness of the problems facing chondrichthyans, leading to greater funding and capacity to increase research efforts and questions into the future.

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